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10/625,406	07/23/2003	G. Lawrence Krablin	TN129C	9074
27276	7590	11/05/2008	EXAMINER	
UNISYS CORPORATION			DAO, THUY CHAN	
UNISYS WAY			ART UNIT	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/625,406

Applicant(s)

KRABLIN ET AL.

Examiner

Thuy Dao

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 14-16 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 14-16 and 27-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This action is responsive to the amendment filed on August 1, 2008.
2. Claims 1-3, 14-16, and 27-29 have been examined.

Response to Arguments

3. Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections – 35 USC §101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 14-16 are rejected because the claimed invention is directed to non-statutory subject matter: independent claim 14 directs to "A translator", which may comprise only software components as claimed and disclosed in FIG. 1, Translator 10.

Claim 14 amount(s) to Functional Descriptive Material: "Data Structures" representing descriptive material per se or "Computer Programs" representing computer listings per se.

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions. See MPEP 2106.

Dependent claims 15-16 do not cure the deficiencies as noted above, thus, also amount to Functional Descriptive Material: "Data Structures" representing descriptive material per se or "Computer Programs" representing computer listings per se.

Under the principles of compact prosecution, claims 14-16 have been examined as the Examiner anticipates the claims will be amended to obviate these 35 USC § 101 issues. For example, - *A translator [[operating on a processor]] , embedded in a central processing unit (CPU), for translating...* - as disclosed in FIG. 1 and related text.

6. Claims 27-29 are directed to a computer readable medium, which may include communication medium (specification, page 7, lines 28-29).

A computer readable medium product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of Sec. 101 – see MPEP 2106

Under the principles of compact prosecution, claims 27-29 have been examined as the Examiner anticipates the claims will be amended to obviate these 35 USC § 101

issues. For example, - ...*computer-readable medium* [[having]] storing computer-executable instructions ...- as disclosed in FIG. 1, memory 18 attached to processor 16 and related text.

Claim Rejections – 35 USC §102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 14-16, and 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,463,582 to Lethin et al. (art made of record, hereafter "Lethin").

Claim 1:

Lethin discloses *a method of translating compiled programming code from a first compiled code state to a second compiled code state, the first compiled code state comprising machine-specific object code corresponding to a first processor instruction set and the second compiled code state comprising machine-specific object code corresponding to a different processor instruction set (e.g., col.48: 6-48; col.51: 24-67),*

the programming code in the first compiled code state comprising a plurality of basic blocks, each basic block comprising a set of instructions (e.g., col.23: 47-67; col.24: 1-30; col.47: 18-36),

at least one basic block ending in a dynamic branch, the dynamic branch being a transfer to one of a set of destinations based on a calculation of a destination address (e.g., col.5: 21-35; col.48: 59 - col.49: 5; col.17: 1-43),

the method comprising the steps of: identifying the plurality of basic blocks in the first compiled code state of the programming code (e.g., col.6: 1-9; col.5: 9-28);

identifying links between the identified basic blocks (e.g., col.5: 9-28; col.24: 1-30; col.49: 42-64; col.47: 12-36);

constructing a control flow graph / representation (CFG) of the programming code based on the identified basic blocks and identified links, the CFG being in a preliminary form (e.g., col.5: 65 – col.6: 16);

identifying at least one basic block ending in a dynamic branch (e.g., col.24: 1-30);

exploring, based on the CFG, and without information from a source external to the first compiled code state of the programming code (e.g., col.6: 1-16; col.32: 35-44; col.34: 22-38),

all identified basic blocks that lead to the dynamic branch as far back as is necessary to fully determine a set of destination addresses for the dynamic branch (e.g., col.38: 58 – col.39: 16; col.24: 1-30),

the set of destination addresses defining the set of destinations from the dynamic branch (e.g., col.19: 10-31; col.20: 22-56);

examining the set of destinations to identify a branch table; updating the CFG to reflect the set of destinations and the identified branch table (e.g., col.20: 61 – col.21: 12; col.17: 20-65); and

translating the programming code from the first compiled code state to the second compiled code state based at least in part on the updated CFG (e.g., col.17: 45 – col.18: 12; col.57: 44 – col.58: 47).

Claim 2:

Lethin discloses the method of claim 1 wherein the exploring step comprises the steps of: for each explored basic block, constructing a corresponding code graph / representation (code graph) of the instructions in such basic block (e.g., col.48: 6-48; col.23: 47-67); and

traversing each code graph to determine the set of destination addresses from the dynamic branch (e.g., col.5: 21-35; col.24: 1-30).

Claim 3:

Lethin discloses the method of claim 2 wherein each code graph is rooted directed acyclic graph having interconnected nodes, each node being one of:

an instruction node representing an instruction in the corresponding basic block; an argument node representing an argument in the corresponding basic block (e.g., col.5: 65 – col.6: 16);

an apply node edging to an instruction node and to an argument node and representing the application of such argument node to such instruction node (e.g., col.32: 35-44),

the apply node in certain instances also being an argument node edged to by another node (e.g., col.34: 22-38);

a stack node edging to a pair of argument nodes and acting as an argument node having the pair of argument nodes (e.g., col.19: 10-31; col.20: 22-56);

a missing argument node representing a missing argument supplied from a different basic block (e.g., col.17: 20-65; col.48: 59 – col.49: 5); and

an alias node edged to by a stack node or apply node and edging to an argument remote from such stack node, and representing such remote argument to such stack node (e.g., col.51: 24-67; col.57: 44 – col.58; 47).

Claims 14-16:

Claims 14-16 are translator versions, which recite(s) the same limitations as those of claims 1-3, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claims 14-16.

Claims 27-29:

Claims 27-29 are computer-readable storage medium versions, which recite(s) the same limitations as those of claims 1-3, wherein all claimed limitations have been addressed and/or set forth above. Therefore, as the reference teaches all of the limitations of the above claim(s), it also teaches all of the limitations of claims 27-29.

Conclusion

9. Any inquiry concerning this communication should be directed to examiner Thuy Dao (Twee), whose telephone/fax numbers are (571) 272 8570 and (571) 273 8570, respectively. The examiner can normally be reached on every Tuesday, Thursday, and Friday from 6:00AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached at (571) 272 3695.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Thuy Dao/
Examiner, Art Unit 2192

/Tuan Q. Dam/
Supervisory Patent Examiner, Art Unit 2192